Jakomäki-Vaarala and Fazerila Wetlands

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2017

Liao , W 2017 , Jakomäki-Vaarala and Fazerila Wetlands . University of Helsinki, Ecosystems and Environment Research Programme , Helsinki .

http://hdl.handle.net/10138/306298

unspecified
publishedVersion

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November 2017

Content

1 Introduction

The Jakomäki-Vaarala and the Fazerila wetland survey is part of my PhD project, studying macroinvertebrates in urban wetlands. I study 22 ponds distributed in different parts of the Great Helsinki area. 18 ponds are in Helsinki, and 4 ponds are in Vantaa. The main research question in this survey is if wetland groups support more biodiversity than isolated wetlands. The Jakomäki-Vaarala wetlands were chosen as a wetland group, as they are close to one another. The Fazerila wetland was chosen as an isolated wetland. The fieldwork reported here was carried out from May to August 2017.

2 The Jakomäki-Vaarala and the Fazerila Wetlands

The Jakomäki-Vaarala wetland group locates near the border between Helsinki and Vantaa. The area was originally covered with forests. Since the 1950s, the ponds were formed by taking sands to meet construction need. The Jakomäki-Vaarala wetland group consists of four different permanent ponds, namely the Sydänlampi, the Twin-Länsi, the Twin-Itä, and the Vaaralanlampi (**Figure 1**). The Sydänlampi is located on the Helsinki side, while the other three ponds are situated on the Vantaa side. The Twin-Länsi and the Twin-Itä ponds are connected with each other.

The Fazerilanplotti is located the opposite of Fazerila. The crow-fly distance between the Fazerilanplotti and the Jakomäki-Vaarala wetland group is approximately 1 km. The Fazerilanplotti is a temporary pond, and it may dry up during summer.

non-vegetated areas. The smooth newts (*Lissotriton vulgaris*), frog tadpoles and fish occasionally were trapped in the activity traps, but all were alive and released back to water.

Figure 2 Activity traps used in this study were made of 1-litre glass jars with a funnel. The main parts were attached to each other with a silicone band and 3 iron hooks. An end of a string was tied to a trap, and the other end was tied to aquatic vegetation or bush near the shore.

2.2.2 Vertebrates in the Wetlands

The Jakomäki-Vaarala and the Fazerila wetlands provide habitats for different vertebrates (Table 2). Common gulls (*Larus canus*) and black-headed gulls (*L. ridibundus*) were visiting these ponds for fish. According to some residents, fish was introduced into the Jakomäki-Vaarala wetlands for recreation purposes by local people. The caught fish was the crucian carp (*Carassius carassius*). No gulls visited the Fazerilanplotti, very likely because it is fishless. Common sandpipers (*Actitis hypoleucos*) were observed in the Sydänlampi in May. Mallards (*Anas platyrhynchos*) were seen feeding in the wetland group during the whole fieldwork season. A mallard brood with 2 chicks was seen in July.

Amphibians include frogs (the Family Ranidae) and the smooth newts (*Lissotriton vulgaris*). Frogs were found breeding in the Fazerilanplotti and the Jakomäki-Vaarala wetland group except the Vaaralanlampi. The smooth newts were abundant in the Twin ponds (Twin-Länsi and Twin-Itä) and the Fazerilanplotti.

Table 2 Vertebrates observed in the Jakomäki-Vaarala and the Fazerila ponds. "x" means the species/ taxon was present.

	Jakomäki-Vaarala Wetland Group				Fazerila
Species/Taxa	**Sydän-Lampi**	**Twin-Länsi**	**Twin-Itä**	**Vaaralan-Lampi**	**Fazerilan-plotti**
Actitis hypoleucos	x				
Anas platyrhynchos	x	x	x		x
Carassius carassius	x	x	x		
Larus canus	x	x	x		
L. ridibundus	x	x	x		
Lissotriton vulgaris		x	x		x
Ranidae	x	x	x		x

2.2.3 Invertebrates in the Wetlands

The Jakomäki-Vaarala and the Fazerila wetlands also support different invertebrates (**Table 3**). The wetlands support a wide range of aquatic insects, including Chironomidae, Corixidae, Ephemeroptera, Notonectidae, Odonata, Trichoptera, and aquatic beetles (Coleoptera). The larvae of 4 dragonfly genera (*Aeshna* sp., *Coenagrion* sp., *Libellula* sp., and *Sympetrum* sp.) were found. An adult of the four-spotted chaser (*Libellula quadrimaculata*) was observed in the Fazerilanplotti.

Aquatic beetles include Dytiscidae, Erotylidae, Gyrinidae, Haliplidae, Hydrochidae, and Noteridae. Erotylidae and Haliplidae were found only in the Twin-Länsi pond. Only one individual of Erotylidae was found during the whole summer, which indicates that it

might have occurred randomly. Gyrinidae and Hydrochidae were found only in the Fazerilanplotti. The larvae of Dytiscidae and Gyrinidae were found in the Fazerilanplotti, which indicates the two families were breeding there.

Other trapped fauna were crayfish (Astacoidea), Cladocera, Copepoda, Hirudinea, Oligochaeta, Hydrachnidia, Tetragnathidae, and Mollusca. The crayfish was introduced.

Table 3 Different invertebrates trapped in the Jakomäki-Vaarala and the Fazerila ponds. "x" means the taxon was present.

		Jakomäki-Vaarala Wetland Group				Fazerila
Taxa		**Sydän-Lampi**	**Twin-Länsi**	**Twin-Itä**	**Vaaralan-Lampi**	**Fazerilan-plotti**
***Asellus* sp.**		x	x			
Astacoidea					x	
Chironomidae		x				
Cladocera		x				x
Copepoda						x
Corixidae		x				x
Dytsicidae		x	x		x	x
Ephemeroptera		x	x	x		
Erotylidae			x			
Gyrinidae						x
Haliplidae			x			
Hirudinea		x			x	
Hydrachnidia		x			x	x
Hydrochidae						x
Hydrophilidae						x
Mollusca	*Bithynia* sp.	x		x		x
	Pisidium sp.				x	x
Noteridae			x			x
Notonectidae		x				x
Odonata	*Aeshna* sp.			x		
	Coenagrion sp.	x				
	Libellula sp.	x	x	x		x
	Sympetrum sp.	x	x	x	x	x
Oligochaeta		x		x		
Trichoptera		x				
Tetragnathidae		x				
Total taxa number		**14**	**8**	**4**	**6**	**12**

2.2.4 General Information about the Fauna

Vertebrates

Common gulls (*Larus canus*) nest on rocky islets or high sites, such as roofs, and the top of boulders. They start breeding in later April, and the eggs are incubated by both parents. Fledglings rely on food provided by parents. Common gulls prefer invertebrates and small fish.

Black-headed gulls (*Larus ridibundus*) breed from late April. Their nests are built on a vegetation pile or floating on a lake or bay. They may build nests on islets. Both parents participate in incubating. Black-headed gulls feed on worms and fish.

Mallards (*Anas platyrhynchos*) are the most common duck species in Finland. Mallards breed in April and May. Their nests are usually concealed and can be far away from water. Ducklings start to seek food after hatching, led by their mother. Mallards mainly feed on plants and invertebrates. Some birds stay in open waters in urban areas during winter. In this case, they may rely on bread and biscuit that people offer.

Common sandpipers (*Actitis hypoleucos*) start breeding in May. Eggs are incubated by both parents. The nests of common sandpipers are normally hidden among vegetation near shores. The chicks start to learn to feed by themselves after hatching. They feed on invertebrates.

Smooth newts (*Lissotriton vulgaris*) breed from April to June. Eggs are laid on aquatic plant leaves separately. Smooth newts spawn in small, half-shadowed waters and prefer fishless ponds. Outside the breeding season, they live and hibernate on land. They hide under rocks and branches during the day and are active at night. Smooth newts feed on

planktons and invertebrates.

Frogs (the family Ranidae). There are two frog species in Finland, common frog (*Rana temporaria*) and moor frog (*R. arvalis*). Common frogs breed in still freshwaters about 20 cm deep, laying 1500 – 3000 eggs per time. Moor frogs like similar habitats and lay 1000 – 2000 eggs per time. The tadpoles of both species feed on algae, detritus, and insects. Adults mainly eat invertebrates, such as flies, snails, and worms. Moor frogs prefer untouched areas but sometimes also appear in urban ponds. Increasing acidity of pond water (i.e. low pH) has negative impacts on embryos and tadpoles of frogs [1].

Invertebrates

Water louses (*Asellus* sp.) are freshwater invertebrates, but they can tolerant salinity up to 1.5‰. Waterlouses feed on plants and remnants. They mainly copulate in spring.

Nonbiting midges (Chironomidae) feed on dead organic matter and planktons. Larvae and pupae are important food for fish, smooth newts, and aquatic insects, such as Corixidae and water beetles. Nonbiting midge adults can fly, and some species also exploit winds for dispersal.

Water fleas (Cladocera) feed on organic detritus and bacteria. Water fleas undergo mainly asexual reproduction and occasionally sexual reproduction. When sexual reproduction occurs, water fleas lay long-lasting dormant eggs, which can be dispersed by winds onto land. Eggs hatch under favourable conditions.

Water boatmen (Corixidae) live in ponds and streams with low speed. They swim near the bottom. Water boatmen are mostly herbivores. Their reproduction cycle is annual.

Eggs are laid on submerged plants or rocks. Water boatmen have a good capability of flight, which allows them to disperse to one water body to another.

Backswimmers (Notonectidae) are predaceous aquatic insects living in still freshwater. They even prey on tadpoles and small fish. Backswimmers can fly well and easily disperse to new habitats.

Mayflies (Ephemeroptera) larvae, also called nymphs, are aquatic. They inhabit under rocks, in vegetation or in sediments. Nymphs feed on algae, diatoms and detritus. Mayfly adults can fly. They may disperse by wind, and their eggs can be dispersed to new environments by attaching to the legs of waterbirds.

Whirligig beetles (Gyrinidae) normally swim on the water surface, and they can also swim underwater if disturbed. Most adults can fly. They prefer aquatic environments with slow and steady water flow. They eat detritus, insects, and other small animals. Whirligig beetles are sensitive to pollution.

Crawling water beetles (Haliplidae) prefer vegetated edges of water bodies, such as ponds or streams. Adults can fly well. Some species, such as *Peltodytes* spp., lay eggs on the surface of aquatic vegetation, while some species, such as *Haliplus* spp., lay eggs in the hole that they created in plants. Larvae feed on algae, while adults eat algae, insect eggs, and tiny crustaceans.

Water scavengers (Hydrophilidae) are mostly aquatic beetles, but some hydrophilids are also terrestrial. Adults are capable of flight. Water scavengers prefer shallow water. Larvae are predaceous and prey on mosquito larvae and snails. Some adults are predaceous, while some are scavengers that feed on algae, dead plant and animal materials. The family Hydrochidae earlier was classified as Hydrophilidae.

Burrowing water beetles (Noteridae) prefer still waters with vegetation. Larvae live in the stem of aquatic vegetation. Adults are predaceous, while larvae can be omnivorous. Adults have a capability of flight.

Dragonflies (Odonata) prey on insects throughout their life. Adults are capable of flight. They lay eggs in water or on plants near water. Larvae are aquatic. Dragonflies can be used as an indicator of river water quality, as they rely on high quality for development of their larvae.

Aquatic Oligochaeta inhabits in the sediment or among vegetation in shallow water. They feed on detritus. Oligochaeta may use frogs as a vehicle for their dispersal.

Leeches (Hirudinea) are an indicator of permanent water, as they cannot survive in temporary ponds. Some species prey on small invertebrates. Some species feed on decomposing animal materials or open wounds of animals. Only one species, *Hirudo medicinalis*, is bloodsucking, and it is near-threatened in the IUCN Red List [2] and vulnerable in Finland [3]. Leeches may be dispersed by waterbirds, as some species are parasites.

Caddisfly (Trichoptera) adults are terrestrial and capable of flight. Larvae are aquatic. Eggs are laid on the water surface or the surface of emergent plants. Larvae of different caddisfly species prefer different water speed. Similar to dragonflies, caddisflies are also sensitive to pollution.

Water mites (Hydrachnidia) are predaceous. They mainly feed on crustaceans, insect eggs and larvae. Water mite larvae are often parasitengones of insects, and they rely on their host insects to disperse to other water bodies. Water mite larvae often leave the water with their hosts, but other stages of water mites, i.e. pupa-like proto-and

tritonymphs and adults, are strictly aquatic.

Long-jawed orb weavers (Tetragnathidae) are spiders. They normally weave small webs. They often appear on vegetation near water.

Diving beetles (Dytiscidae) are one of the top predators in fishless ponds. The larvae are predaceous. They have strong mandibles to catch invertebrates, such as mosquito larvae, and even vertebrates, such as small fish. Adults do not have mandibles as strong as their larvae's. Some dytiscid species feed on algae and detritus after they become adults. Adults of most dytiscid species are capable to fly. Some species, however, are poor flyers due to the lack of wings or flight muscles. Different dytiscid species overwinter in different forms, i.e. eggs, larvae, or adults, but no record shows that they overwinter as pupas.

Most diving beetle species prefer habitats with lush vegetation and slow-speed water, and a few species prefer fast-speed water. Water bodies with dense vegetation support more diving beetles species and abundance than barren ones in general. Although dytiscids can dive, many of them are poor swimmers and only occur in dense vegetation, especially mosses, such as *Sphagnum* spp. In large water bodies, most diving beetles occur in the shallow margins. Some species can be found in deep waters.

Diving beetles were found both in the Jakomäki-Vaarala wetland group and the Fazerilanplotti. Five species were found in the wetland group in total, while 24 species were detected in the Fazerilanplotti (**Table 4**). In the Fazerilanplotti, two near threatened species (*Hydroporus notatus* and *H. pubescens*) were found. Furthermore, *Graptoderus granularis* was found only in Fazeriilanplotti and *G. pictus* was found only in the Sydänlampi, but not in any other of the 20 urban wetlands I studied in the Great Helsinki Area.

Table 4 The total species number and abundance of Dytiscidae trapped in each pond from May to August 2017. "NT" means that the species is near threatened.

Species	Sydän-lampi	Twin-Länsi	Twin-Itä	Vaaralan-lampi	Fazerilan-plotti
Agabus affinis					2
Ag. bipustulatus					4
Ag. fuscipennis larva					1
Ag. sturmii					1
Ag. unguicularis					1
Acilius canaliculatus	3	1			
Ac. canaliculatus larvae	1				
Graphoderus zonatus					17
G. zonatus larvae					1
Graptodytes granularis					8
Grapt. pictus	6				
Hydaticus seminiger		2			2
Hydroporus angustatus					2
Hyd. erythrocephalus					5
Hyd. incognitus					1
Hyd. morio					1
Hyd. notabilis					1
Hyd. notatus (NT)					1
Hyd. obscurus					1
Hyd. palustris					1
Hyd. pubescens (NT)					1
Hyd. striola	1				
Hyd. umbrosus					4
Hygrotus decoratus					2
Hyg. inaequalis				5	
Hyphyrus ovatus					2
Ilybius ater					4
I. crassus					4
I. wasastjernai larvae					1
Rhantus fennicus					4
R. (Nartus) grapii larvae					1
Total species number	**3**	**2**	**0**	**1**	**25**

3 The Wetlands and their Management

3.1 Sydänlampi

The Sydänlampi is the only pond located on the Helsinki side. It is about 0.43 hectare large. The area was still a forest in the 1940s, and deforestation started in the 1950s. The Sydänlampi was originally two ponds. Only after 1964, the two ponds were formed into a heart shape. Most part of the Sydänlampi edge is steep (**Figure 3**), but the beach areas have easy access to people. The Sydänlampi provides recreational sites for local people as well as their dogs.

Figure 3 A view of the Sydänlampi. Most part of the Sydänlampi edge is steep.

The Sydänlampi area is known to support northern bats (*Eptesicus nilssonii*) and birds, such as common sandpipers (*Actitis hypoleucos*), and wood warblers (*Phylloscopus sibilatrix*) [4-5]. The Sydänlampi earlier seemed to also provide habitats for horned grebes (*Podiceps auritus*), a vulnerable waterbird species, although they were not observed during summer 2017. The activity traps caught three diving beetle species and

many other macroinvertebrate taxa from May to August 2017, but the abundance of the macroinvertebrates was not high in general (**Appendix 1**).

Management suggestion: Part of the edge could be constructed to be less steep, as most macroinvertebrates prefer shallow waters. Aquatic vegetation can be added to the Sydänlampi as the Figure 4 shows. Sedges (Cyperaceae), rushes (Juncaceae), and cattails (*Typha* spp.) can be good emergent plant options, as the horned grebes prefer these aquatic plants. Emergent vegetation can also provide shelters for chicks of other waterbirds. Mosses, such as *Sphagnum* spp. and *Drepanocladus* spp., can be added for aquatic invertebrates.

Figure 4 Aquatic vegetation can be added to the Sydänlampi to provide habitats for waterbirds and macroinvertebrates.

3.2 Twin-Länsi and Twin-Itä

Unlike the Sydänlampi, the Twin-Länsi and the Twin-Itä ponds were originally one big shallow pond. The Twin-Länsi part was the first pond formed among the

Jakomäki-Vaarala wetland group. It was formed in the early 1950s and later enlarged. The connection between the present Twin-Länsi and Twin-Itä ponds became narrower and narrower since the 1960s. In the 1980s, the width of the connection of the two ponds became approximately 7 m, and a bridge was constructed, which acts as the border of the two parts. The present Twin-Länsi pond is about 0.47 hectare. The Twin-Itäis slightly smaller, approximately 0.41 hectare.

Figure 5 The Twin-Länsi (left) and the Twin-Itä (right) ponds.

The Twin ponds harbour interesting fauna. The smooth newts (*Lissotriton vulgaris*) were only detected in the Twin ponds but not in the other two nearby ponds, possibly because the Twin ponds are shallow, with non-steep shores and moderate vegetation. Both the smooth newts and frogs were breeding in the ponds. Larvae of three different dragonfly genera (*Aeshna* sp., *Libellula* sp., and *Sympetrum* sp.) were found, and *Libellula* sp. seemed to occur only in the Twin ponds. Other aquatic insects found in the Twin ponds were Dytiscidae, Ephemeroptera, Erotylidae, Haliplidae, Noteridae, and Notonectidae. Their abundance, however, was not high, which may have been resulted from the high abundance of a predator, the crucian carp (*Carassius carassius*).

Management Suggestion: Although the vegetation in the Twin ponds was more abundant than the other two, they were mostly submerged plants. More emergent

aquatic plants could be considered for the Twin ponds for waterbird breeding. It would be ideal to get rid of the fish, as they are the enemy of macroinvertebrates. A small island can be rebuilt (Figure 6) as a habitat for birds far away from human disturbance.

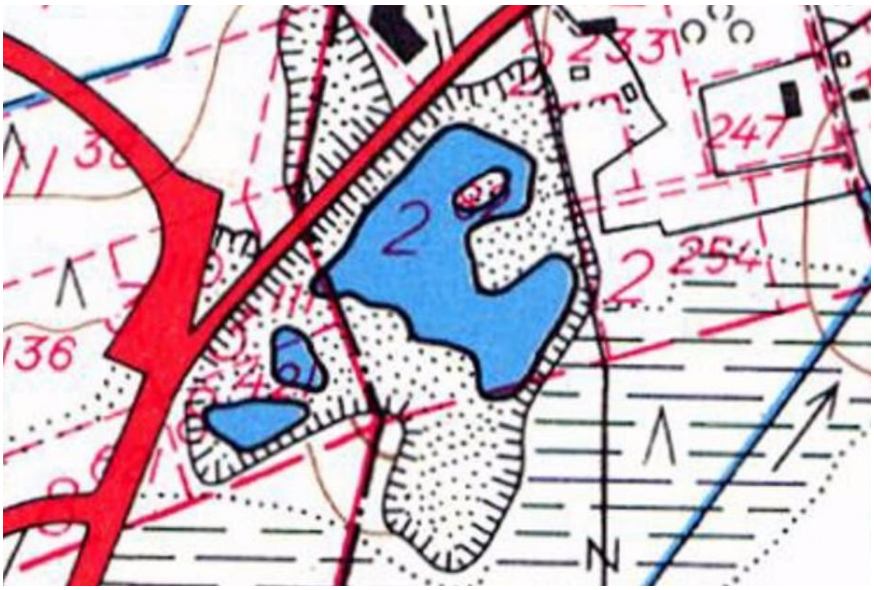

Figure 6 There was a small island in the Twin-Länsi pond in the 1960s.[6]

3.3 Vaaralanlampi

The Vaaralanlampi is the last one constructed among the Jakomäki-Vaarala wetland group. It was formed in the 1960s. The Vaaralanlampi is the deepest pond among the four. The edge of the pond is steep, and no emergent vegetation grows there (**Figure 7**). Most frequently caught macroinvertebrates there were water mites (Hydrachnidia). Interestingly, crayfish was found in the Vaaralanlampi. The crayfish was introduced by people for recreational purposes, according to local people.

Management Suggestion: Biodiversity in this pond is poor, but it seems to be a very good recreational pond for the local people, especially for swimming. It could be further developed for the recreational purpose.

Figure 7 A view of the Vaaralanlampi. No emergent vegetation grows in the whole pond.

3.4 Fazerilanplotti

The Fazerilanplotti area was also originally covered by a forest. In the 1960s, this area was cleared out along with the construction of the Fazer factory on the other side of the Street, Fazerintie. The area became gradually covered by vegetation again in the 1980s. The Fazerilanplotti is a shallow, temporary pond. The wetland is occupied with sedges and other aquatic plants in late spring and summer (**Figure 8**). It dried out by the end of July 2017.

Figure 8 A view of the Fazerilanplotti when it was wet (left) and dried up (right).

Although it is much smaller than the Jakomäki-Vaarala ponds, the Fazerilanplotti had the highest macroinvertebrate biodiversity. It provides breeding sites for aquatic insects, including Dytiscidae, Gyrinidae, and Odonata, i.e. larvae were found. 24 different diving beetle species were found. *Hydroporus notatus* and *H. pubescens* are near-threatened; however, only one individual of each of these species was trapped (Table 4), which indicates that they were very likely to just have occurred but not been breeding there yet. Furthermore, frogs and the smooth newts (*Lissotriton vulgaris*) were also found breeding in the Fazerilanplotti.

Management suggestion: The high macroinvertebrate diversity in the Fazerilanplotti may have resulted from shallow water, dense vegetation, lack of fish, and being far away from human disturbance. If the area is going to be under construction, a pond about 1-2 m deep can be constructed to meet the residents' recreational need as Figure 9 shows. A wooden path with fences can be built around the Fazerilanplotti to keep it away from human and/or dog disturbance. The Fazerilanplotti can also be developed for an educational purpose: information about the values of the Fazerilanplotti and its surroundings could be shown to people what fauna and flora are there and why we should protect them.

Figure 9 A pond can be constructed near the Fazerilanplotti as a recreational site.

Summary

The Jakomäki-Vaarala wetland group and the Fazerila pond were studied in the summer 2017. The Fazerilanplotti had the most diverse invertebrate fauna (Table 3), while the Sydänlampi had the most diverse vertebrate fauna (Table 2). The smooth newts were found in the Twin-Länsi, Twin-Itä, and the Fazerilanplotti (Table 2). The biodiversity value of the Fazerilanplotti should be protected. The Jakomäki-Vaarala wetlands can be developed in different directions. The Vaaralanlampi and probably also the Sydänlampi can be developed for recreation, while the Twin ponds developed for their biodiversity values.

Tiivistelmä

Jakomäki-Vaaralan lampiryhmää sekä Fazerilan kausikosteikkoa tutkittiin lapi kesän 2017. Näistä Fazerilanplotti paljastui selkärangatonfaunaltaan selvästi monimuotoisimmaksi, mutta myös Sydänlammesta tavattiin monta elioryhmää (Taulukko 3). Mantereita eli vesilikoja tavattiin paitsi Fazerilanplotissa myös Kaksoislammissa (Taulukkko 2). Fazerilanplotin monimuotoisuusarvoja kannattaa vaalia. Jakomaki-Vaaralan lampiryhmän eri lampia voisi kehittää eri suuntiin, Vaaralanlampea ja ehkä Sydänlampea virkistyskäyttöön ja Kaksoislampia monimuotoisuusarvot huomioiden.

Appendix 1 The abundance of macroinvertebrates trapped in the Jakomäki-Vaarala and the Fazerila wetlands from May to August 2017.

		Jakomäki-Vaarala Wetland Group				Fazerila
Taxa		**Sydän-Lampi**	**Twin-Länsi**	**Twin-Itä**	**Vaaralan-Lampi**	**Fazerilan-plotti**
***Asellus* sp.**		7	1			
Chironomidae		1				
Cladocera		46				2
Copepoda						2
Corixidae		1				3
Dytiscidae		11	3		5	74
Ephemeroptera		12	2	1		
Erotylidae			1			
Gyrinidae						4
Haliplidae			1			
Hirudinea		1			10	
Hydrachnidia		59			101	5
Hydrochidae						10
Hydrophilidae						4
Mollusca	*Bithynia* sp.	1		3		2
	Pisidium sp.				13	6
Noteridae			1			1
Notonectidae		19				2
Odonata	*Aeshna* sp.			2		
	Coenagrion sp.	1				
	Libellula sp.	5	3	4		1
	Sympetrum sp.	2	1	1	1	2
Oligochaeta		1		1		
Trichoptera		1				
Tetragnathidae		1				

Appendix 2 Tables in Finnish/ Taulukot suomeksi.

Taulukko 1 Jakomäki-Vaarala ja Fazerila lampien vesikemian tiedot (8.6.2017). “N” tarkoittaa typen ja “P” fosfori kokonaismäärä. “O” tarkoittaa happi. Yksikkö “mS/m” tarkoittaa millimhos per metri. “FNU” tarkoittaa Formazin Nephelometric Units.

	Jakomäki-Vaarala Kosteikkoryhmä				Fazerila
	Sydän lampi	Twin-Länsi	Twin-Itä	Vaaralan lampi	Fazerilan plotti
Max Syvyys (m)	3.5	<1	<1	4	<1
Lämpötila (°)	16.5	16.4	16.1	15.70	13.3
pH	7.35	7.89	7.40	7.50	7.04
N (µg/L)	360	460	390	220	800
P (µg/L)	9	19	20	6	54
O (mg/L)	9.46	10.29	10.52	10.27	8.56
Happimolekyyli (%)	96.9	100	100	100	82.2
Sähkönjohtavuus (mS/m)	7.66	14.45	17.28	9.27	3.75
Sameus (FNU)	0.0	0.8	2.7	0.6	2.3
Tuoksu	ei	ei	ei	ei	ei
Väri	ei	ei	ei	ei	ruskehtava

Taulukko 2 Jakomäki-Vaaralan ja Fazerilan kosteikoissa havaitut selkärankaiset.

	Jakomäki-Vaarala Kosteikkoryhmä				Fazerila
Taksonit	**Sydän-Lampi**	**Twin-Länsi**	**Twin-Itä**	**Vaaralan-Lampi**	**Fazerilan-plotti**
Rantasipi	1				
Sinisorsa	3	8	1		1
Ruutana	2	17	22		
Kalalokki	1	3	3		
Naurulokki	1	1	1		
Manteri*		9	9		9
Sammakon toukat	4	1	2		97

* Ent vesilisko.

Taulukko 3 Jakomäki-Vaarala ja Fazerilan kosteikoissa pyydystäyjen selkärangattomien määrä.

		Jakomäki-Vaarala Kosteikkoryhmä				Fazerila
Takosonit		**Sydän-Lampi**	**Twin-Länsi**	**Twin-Itä**	**Vaaralan-Lampi**	**Fazerilan-plotti**
Vesisiira		x	x			
Rapu					x	
Surviaissääsket		x				
Vesikirput		x				x
Hankajalkaiset						x
Pikkumalluaiset		x				x
Sukeltajakuoriaiset		x	x		x	x
Päivänkorennot		x	x	x		
Helysieniäiset			x			
Hopeasepät						x
Pisarsukeltajat			x			
Värysmadot		x			x	
Vesipunkit		x			x	x
Rosovesiäinen						x
Vesiäiset						x
Nilviäiset	*Bithynia* sp.	x		x		x
	Pisidium sp.				x	x
Pohjasukeltajat			x			x
Isomalluaiset		x				x
Suden-korennot	*Aeshna* sp.			x		
	Coenagrion sp.	x				
	Libellula sp.	x	x	x		x
	Sympetrum sp.	x	x	x	x	x
Harvasukasmadot		x		x		
Vesiperhoset		x				
Sauvaristihämähäkit		x				
Taksonien määrä yhteensä		**14**	**8**	**4**	**6**	**12**

Acknowledgement

I thank the City of Helsinki for taking and analysing water samples. I thank Dr. Petri Nummi for wetland management advice and the Finnish summary.

References

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[3] https://laji.fi/taxon/MX.232488

[4] https://kartta.hel.fi/applications/ltj/reports/kohderaportti.aspx?id=176397

[5] https://kartta.hel.fi/applications/ltj/reports/kohderaportti.aspx?id=180742

[6] Old map: Base map 1967 https://kartta.vantaa.fi/